REMARKS

Applicants would like to thank Examiner White for the courtesy extended to undersigned attorney Kathleen Frost during the personal interview conducted on July 23, 2003.

Claims 29-32, 55, 63 and 66 are cancelled. Claims 1, 3, 4, 5, 7, 10, 12, 19, 22, 33, 34, 44, 51, 53, 54, 56, 57, 60, 61, 64, 65, 67, 69, 71 and 71 are currently amended. Claims 86 – 94 are new. Claims 1-28, 33-54, 56 –62, 64-65 and 66 – 94 are pending.

The follow remarks address the Final Office Action mailed July 2, 2003.

Each of the claims stands rejected as being anticipated or made obvious by Chang et al, U.S. 5,342,054, or as being made obvious by the combined teachings of Chang et al and Sullivan U.S. 4,158,853. The patentability of the claims over these references is addressed below.

As mentioned during the interview, in Applicant's April 4, 2003 response, Applicants comments were inadvertently directed to Sullivan 4,136,387 (which is also of record) rather than to Sullivan 4,158,853. The undersigned attorney apologizes for any confusion this may have caused.

I. Claims 1 – 6

Claim 1 includes the recitation of first and second arrays of sensors, a processor for receiving signals indicative of a temporal profile of which sensors the golf club head is over during the swing and for determining at least one of a swing path and a club head angle of the golf club based on the signals indicative of the temporal profile. These features carry through to dependent claims 2 – 7.

Although Chang et al describe two sensor arrays, these arrays are used only to trigger the capturing of images of the club and ball and for determination of club speed. Signals representing the temporal profile of activation of the various sensors are not used in the Chang et al system to determine club head angle or swing path. No discussion of club head angle is found in Chang et al. Moreover, the Chang et al system is described as displaying snapshots of the club head during the swing and illustrating the swing path in the manner shown in Fig. 4, rather than based on signals indicative of a temporal profile as recited in the claims. Thus, Chang et al fails to disclose a processor for receiving signals indicative of a temporal profile of which sensors the golf club head is over during the swing and for determining at least one of a swing path and a club head angle of the golf club based on the signals indicative of the temporal profile.

Moreover, there is no fair suggestion for a modification to the Chang et al system to use signals indicative of a temporal profile of which sensors the head is over during the swing and to use those signals to calculate a swing path and/or club head angle. Accordingly, Claims 1 – 6 are patentable over the Chang et al reference.

II. Claims 7 – 33

Claim 7 includes an array of sensors, and a processor for receiving signals indicative of a temporal profile of which sensors the golf club head is over during the swing and for determining a club head angle of the golf club based on the signals indicative of the temporal profile. These features carry through to dependent claims 8 – 33.

As discussed, there is no teaching in Chang et al of (nor is there fair suggestion for) a modification to the Chang et al system to use signals indicative of a temporal profile of which sensors the head is over during the swing and to use those signals to calculate a club head angle. For this reason, Claims 7 – 33 are patentable over the cited references.

III. Claims 34 – 59 and 84

Claim 34 as amended recites an apparatus for determining spin characteristics of a golf ball after impact with a golf club head. The apparatus claimed in Claim 34 includes a camera and a processor, and the processor determines spin of the ball based on an automatic determination of at least one characteristic of only one marking on the ball as shown on images captured only with said camera. These features are carried through to Claims 35 – 59 and 84 which are dependent on Claim 34.

The Chang et al reference is silent as to determination of ball spin. The Sullivan patent discusses calculating ball spin using images from three cameras and a single enhanced spot on the ball. The patent notes that if desired a single camera may be used, in which case a plurality of enhanced spots on the ball are needed to make accurate calculations. Col. 3, lines 45-49. Thus, the Sullivan reference does not disclose (and in fact teaches away from) a processor for determining spin using analysis of a single marking on the ball in images taken from a single camera. Accordingly, Claims 34 – 59 and 84 are patentable over the cited references.

IV. Claims 60 - 68

Claim 60 recites an apparatus for determining velocity in three dimensions of a golf ball after impact with a golf club head based on two or more images of said golf ball captured after said impact. The apparatus as claimed includes an image capture device including a camera, as well as a processor for calculating a three-dimensional ball velocity by determining circumferential extrapolations of perimeters of two or more images obtained only using the camera, by automatically determining and comparing three-dimensional spatial positions of said two or more images, and by calculating the three-dimensional velocity using said three-dimensional spatial position determination and comparison.

As noted in the Office Action, the Chang et al reference does not disclose determination of ball velocity in three dimensions. The Sullivan reference discusses three-dimensional velocity, but it describes calculations made by analyzing the position of the "enhanced spot" on the mark in photographs taken using three cameras. Thus, there is no teaching nor fair suggestion for determining three-dimensional ball velocity by determining circumferential extrapolations of perimeters of images of the ball taken using only one camera. For this reason, Claims 60 – 68 are patentable over the cited reference.

V. Claims 69 – 73

Claim 69 recites an apparatus for determining one or more characteristics of a golf swing. The apparatus includes a processor for receiving signals indicative of a temporal profile of which sensors the golf club head is over during the swing and for determining at least one of a swing path and a club head angle of the golf club based on said signals. As discussed in connection with Claim 1, this feature is absent from the cited references and it is not fairly suggested by the cited art. For this reason, Claims 69-73 are believed patentable.

VI. Claims 74 – 76

Claim 74 as amended recites an apparatus for determining transfer efficiency from a golf club head to a golf ball, and includes a processor for receiving signals indicative of when a golf club is detected by each of two sensors, for using said signals to calculate club head speed during the downswing, for calculating the velocity of the golf ball based on two or more images

captured of the golf ball following impact, and for using the club speed and the ball velocity to calculate the transfer efficiency of the club head to the golf ball at impact. As understood by Applicant, neither Chang et al nor Sullivan teaches the calculation of transfer efficiency using club speed and ball velocity. Accordingly, these claims are not made obvious by the cited combination of references.

VII. Claims 86 - 94

New Claim 86 recites a system for monitoring spin of a golf ball following impact by a golf club. The claim recites a golf ball having a stripe thereon, a camera positioned to capture at least two images of the golf ball following impact by a golf club, and a processor for determining a spin of the ball based on the stripe orientation and/or curvature in the images captured only by the camera. Claims 87 – 94 are dependent on Claim 86 and thus also include these features.

Claims 86 – 94 are believed patentable over the cited references. Specifically, Chang et al lacks any teaching of determining ball spin. Although Sullivan describes methods for determining ball spin, the reference fails to disclose determining ball spin based on the orientation and/or curvature of a ball stripe in images captured using one camera. For this reason, Claims 86-94 are neither anticipated nor made obvious by the Sullivan reference.

VIII. Conclusion

In view of the forgoing amendments and remarks, it is respectfully submitted that all claims are in condition for allowance. Early reconsideration and allowance of the claims is therefore respectfully submitted.

If for any reason the Examiner believes that a telephone conference would in any way expedite prosecution of the subject application, the Examiner is invited to telephone the undersigned at 415.512.1312, extension 103.

Respectfully submitted,

STALLMAN & POLLOCK LLP

Dated: August 29, 2003

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UNITED S ES DEPARTMENT OF COMMERCE
Patent and Trademark Office
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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
09/495,407	1/31/2000	Keith Stivers	OSI-2300/2310

EXAMINER	
White, Carmen	
ART UNIT	**PAPER NUMBER**
3714	14

DATE MAILED:

INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel):

(1) Kathleen Frost (App. Rep.) (3) _____

(2) Carmen White (Examiner) (4) _____

Date of Interview 7-23-03

Type: ☐ Telephonic ☒ Personal (copy is given to ☐ applicant ☒ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No If yes, brief description: _____

Agreement ☐ was reached. ☐ was not reached. ☐ N/A

Claim(s) discussed: Independent claims (1, 7, 34, 60)

Identification of prior art discussed: Sullivan et al (4,158,853) & Chang et al (5,342,054)

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: Applicant's rep. proposed focusing on the following features: 1) 1 camera to determine 3-D velocity; determination of 3-D veloc. by circumferential extrapolation · determination of spin using 1 marking and the determination of swing path of the club based on signals from the sensors - in order to distinguish the present claimed inv. from the cited prior art of Chang and Sullivan.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

1. ☒ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary. A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a response to the last Office action has are ready been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

2. ☐ Since the Examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the interview unless box 1 above is also checked.

Examiner Note: You must sign this form unless it is an attachment to another form.

Carmen White
Patent Examiner, 3714
703-308-5275

FORM **PTOL-413** (REV.1-96)

Manual f Patent Examining Procedure, Section 713.04 Substance f Interview must Be Made of Record

A complete written statement as to the substance of any face-to-face or telephone interview with regard to an application must be made of record in the application, whether or not an agreement with the examiner was reached at the interview.

§1.133 Interviews

* * * * *

(b) In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for response to Office action as specified in §§ 1.111,1.135. (35 U.S.C.132)

§ 1.2. Business to be transacted in writing. All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete a two-sheet carbon interleaf Interview Summary Form for each interview held after January 1, 1978 where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks in neat handwritten form using a ball point pen. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below.

The Interview Summary Form shall be given an appropriate paper number, placed in the right hand portion of the file, and listed on the "Contents" list on the file wrapper. The docket and serial register cards need not be updated to reflect interviews. In a personal interview, the duplicate copy of the Form is removed and given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephonic interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the telephonic interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Serial Number of the application
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (personal or telephonic)
- Name of participant(s)) (applicant, attorney or agent, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the claims discussed
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). (Agreements as to allowability are tentative and do not restrict further action by the examiner to the contrary.)
- The signature of the examiner who conducted the interview
- Names of other Patent and Trademark Office personnei present.

The Form also contains a statement reminding the applicant of his responsibility to record the substance of the interview.

It is desireable that the examiner orally remind the applicant of his obligation to record the substance of the interview in each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner should check a box at the bottom of the Form informing the applicant that he need not supplement the Form by submitting a separate record of the substance of the interview.

It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview:

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner. The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he feels were or might be persuasive to the examiner,
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Stimmary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete or accurate, the examiner will give the applicant one month from the date of the notifying letter or the remainder of any period for response, whichever is longer, to complete the response and thereby avoid abandonment of the application (37 CFR 1.135(c)).

Examiner to Check for Accuracy

Applicant's summary of what took place at the interview should be carefully checked to determine the accuracy of any argument or statement attributed to the examiner during the interview. If there is an inaccuracy and it bears directly on the question of patentability, it should be pointed out in the next Office letter. If the claims are allowable for other reasons of record, the examiner should send a letter setting forth his or her version of the statement attributed to him. If the record is complete and accurate, the examiner should place the indication "Interview record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

*U.S. GPO: 1996-417-381/40538